

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-205412

(43)Date of publication of application : 25.07.2000

(51)Int.Cl.

F16J 15/10
F16K 27/00

(21)Application number : 11-005411

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(22)Date of filing : 12.01.1999

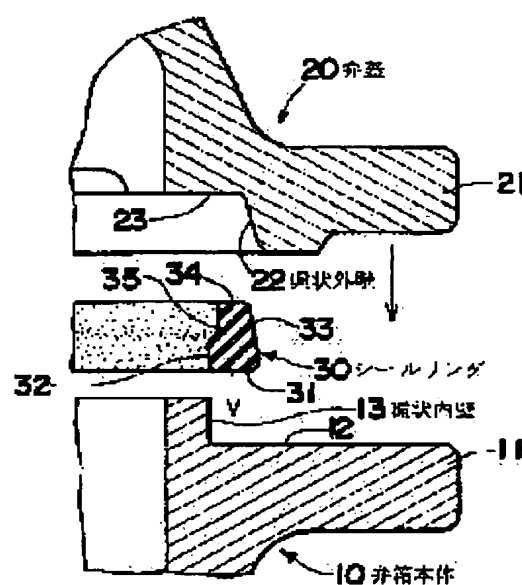
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(54) SEALING STRUCTURE OF VALVE CASING

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a sealing structure for a valve casing, capable of easily performing attachment of a seal ring, lightening assembly operation of a valve casing and a valve cover, and improving the watertightness.

SOLUTION: A ring-inner wall 13 is formed on a valve casing body 10, a ring-outer wall 22 is formed on a valve cover 20, and a seal ring 30 is put between both the walls 13, 22. The seal ring 30 is formed into a sectional form having a bottom face 31 abutting on the valve casing body 10, a vertical inner peripheral surface 32 abutting on the ring-inner wall 13, a conical outer peripheral surface 33 abutting on the ring-outer wall 22, and a top face 34 abutting on the valve cover 20.



LEGAL STATUS

[Date of request for examination]

15.12.2005

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] It is the seal structure between the body of a valve box, and the operculum put on this body of a valve box. The annular wall with which a peripheral face consists of a cylinder side parallel to an axis is formed in the valve box covering side of the body of a valve box. While being a major diameter, and the dimension of the direction of an axis being larger than said annular wall to the body covering side of a valve box of an operculum and forming in it the annular outer wall with which inner skin consists of a conical surface whose diameter was expanded in the direction of the body of a valve box The plane base which contacts the valve box covering side of the body of a valve box in the seal ring arranged between said annular walls and annular outer walls, The vertical-like inner skin which starts from the inner circumference side of this base vertically, and contacts the peripheral face of said annular wall, The cone-like peripheral face which started in the direction whose diameter an operculum side reduces corresponding to the conical surface of said annular outer wall from the periphery side at the bottom, Seal structure of the valve box characterized by forming in the cross-section configuration which has the plane top panel crooked in the direction of inner circumference so that the body covering side of a valve box of said operculum might be contacted from the upper bed of this cone-like peripheral face.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the seal structure for securing the watertightness between the bodies of a valve box and opercula in valve boxes, such as a software seal sluice valve, in detail about the seal structure of a valve box.

[0002]

[Description of the Prior Art] By carrying out flange association on both sides of the seal ring (profile ring) which consists of elastic bodies, such as rubber, between the body of a valve box which has a valve seat etc., and the operculum holding a valve rod etc., valve boxes, such as a software seal sluice valve, are formed, where watertightness is secured.

[0003] The sectional view of an important section in which drawing 4 and drawing 5 show an example of the seal structure between the conventional body of a valve box and an operculum, and drawing 4 shows the condition before assembly, and drawing 5 are the sectional views of an important section showing the condition after assembly.

[0004] While this conventional seal structure forms the step 3 used as a seal ring contact side in the inner circumference of the flange 2 of the body 1 of a valve box, the circular sulcus 7 for inserting a seal ring 6 in the inner circumference of the flange 5 of an operculum 4 is formed, and assembly with the body 1 of a valve box and an operculum 4 is performed by comparing both the flanges 2 and 5 and binding tight with a bolt nut, after inserting in a seal ring 6 in the circular sulcus 7 of an operculum 4.

[0005]

[Problem(s) to be Solved by the Invention] Therefore, in case both were attached, the activity which inserts in a seal ring 6 was required in the circular sulcus 7 which becomes the underside side of an operculum 4, since both dimension relation was set

up so that a seal ring 6 may not fall especially at the time of assembly, the force which an insertion activity takes was also large and the seal ring had to be inserted in certainly and firmly. Furthermore, it deformed into the configuration as shown in drawing 5 in response to internal pressure, and the configuration of seal ring 6 the very thing was also formed in a configuration which demonstrates the predetermined watertight engine performance when the peripheral face was stuck to the clearance between a flange 2 and 5 by pressure.

[0006] For this reason, the difficulty was in the workability in insertion of a seal ring 6 or assembly of an operculum 4, and there was a limitation also in improvement in watertightness.

[0007] Then, this invention aims at offering the seal structure of a valve box where improvement in watertightness can also be aimed at while it can equip with a seal ring easily and can aim at relief of assembly with the body of a valve box, and an operculum.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned object, the seal structure of the valve box of this invention It is the seal structure between the body of a valve box, and the operculum put on this body of a valve box. The annular wall with which a peripheral face consists of a cylinder side parallel to an axis is formed in the valve box covering side of the body of a valve box. While being a major diameter, and the dimension of the direction of an axis being larger than said annular wall to the body covering side of a valve box of an operculum and forming in it the annular outer wall with which inner skin consists of a conical surface whose diameter was expanded in the direction of the body of a valve box The plane base which contacts the valve box covering side of the body of a valve box in the seal ring arranged between said annular walls and annular outer walls, The vertical-like inner skin which starts from the inner circumference side of this base vertically, and contacts the peripheral face of said annular wall, It is characterized by forming in the cross-section configuration which has the cone-like peripheral face which started in the direction whose diameter an operculum side reduces corresponding to the conical surface of said annular outer wall from the periphery side at the bottom, and the plane top panel crooked in the direction of inner circumference so that the body covering side of a valve box of said operculum might be contacted from the upper bed of this cone-like peripheral face.

[0009]

[Embodiment of the Invention] the sectional view of an important section in which drawing 1 thru/or drawing 3 show the example of 1 gestalt of the seal structure of the

valve box of this invention, and drawing 1 shows the condition before assembly, the sectional view of an important section in which drawing 2 shows the condition after assembly, and drawing 3 show an example of the sluice valve of the inner screw type which applied the seal structure of this invention -- it is a cross-section front view a part.

[0010] First, a sluice valve carries out flange association of the body 10 of a valve box which has a valve seat, a flange for piping connection, etc., and the operculum 20 which has a valve rod etc. through the seal ring 30 formed with elastic bodies, such as rubber, and an operculum 20 is attached to the body 10 of a valve box, where the valve rod which penetrates an operculum 20 is equipped with a valve element.

[0011] The flange 11 is formed in the operculum covering side of the upper part of the body 10 of a valve box at the periphery, and the operculum covering side 12 is formed in the flange top-face part. The annular wall 13 with which a peripheral face becomes the inner circumference part of this operculum covering side 12 from a cylinder side parallel to an axis is established in the condition of having projected in the operculum 20 side.

[0012] Moreover, as said flange 11 is countered, the flange 21 is formed in the lower part of an operculum 20, and the annular outer wall 22 corresponding to said annular wall 13 and the body covering side 23 of a valve box corresponding to said operculum covering side 12 are established in the inner circumference part of this flange 21.

[0013] The annular outer wall 22 enables it to form the tooth space which puts a seal ring 30 between the annular wall 13 and the annular outer wall 22, when the bore is formed in the major diameter rather than the outer diameter of the annular wall 13 and attaches the body 10 of a valve box, and an operculum 20. Moreover, the dimension (height) of the direction of an axis of the annular outer wall 22 is set up more greatly than the dimension (height) of the annular wall 13, and when the head (soffit) of the annular outer wall 22 contacts the operculum covering side 12, the moderate spacing S (refer to drawing 2) is formed between the head (upper bed) of the annular wall 13, and the body covering side 23 of a valve box. Furthermore, the inner skin of the annular outer wall 22 is formed in the conical surface whose diameter the body 10 side of a valve box by the side of a lower part expanded.

[0014] The seal ring 30 with which it is equipped between the annular walls 13 and the annular outer walls 22 which were formed as mentioned above The plane base 31 adjacent to the valve box covering side 12 of the body 10 of a valve box, and the vertical-like inner skin 32 which starts from the inner circumference side of this base 31 vertically, and contacts the peripheral face of said annular wall 13, The cone-like

peripheral face 33 which started in the direction whose diameter an operculum 20 side reduces corresponding to the conical surface of said annular outer wall 22 from the periphery side of a base 31. It has the plane top panel 34 crooked in the direction of inner circumference so that the body covering side 23 of a valve box of said operculum 20 might be contacted from the upper bed of this cone-like peripheral face 33. Further between the inner circumference edge of a top panel 34, and the upper bed of said vertical-like inner skin 32 It is formed in the cross-section configuration where the circular face 35 which curved to the periphery side was formed.

[0015] Moreover, the bore of a seal ring 30 is formed in the minor diameter identically to the outer diameter of the annular wall 13 thru/or slightly, and enables it to attach a seal ring 30 in annular wall 13 part certainly. Furthermore, the height (distance of a base 31 and a top panel 34) of a seal ring 30 is set up more greatly than spacing of the valve box covering side 12 and the body covering side 23 of a valve box at the time of attaching the body 10 of a valve box, and an operculum 20. Therefore, it will be equipped with a seal ring 30 in the condition of having been compressed between the valve box covering side 12 and the body covering side 23 of a valve box.

[0016] Thus, anchoring of the seal ring 30 at the time of attaching the body 10 of a valve box, and an operculum 20 by forming Since there is no possibility of falling like before further that what is necessary is just to put a seal ring 30 on the periphery of the annular wall 13 of the body 10 of a valve box which turns the valve box covering side 12 up, and is placed There is no fitting ***** need firmly and the annular wall 13 and a seal ring 30 can be easily performed by the light force compared with what is firmly inserted in in a circular sulcus like before.

[0017] And since the annular outer wall 22 of an operculum 20 contacts in an inclined plane to the cone-like peripheral face 33 of the seal ring 30 attached in the body 10 of a valve box, it is hard to produce location gap of a seal ring 30, and a seal ring 30 can be put between a position.

[0018] When both the flanges 11 and 21 are bound tight with a bolt nut, moreover, a seal ring 30 It will be attached in the condition of having been compressed between the valve box covering side 12, the annular wall 13, the body covering side 23 of a valve box, and the annular outer wall 22. At the time of an activity From said spacing S, internal pressure acts on a seal ring 30, and is compressed further, and since it will be in the condition of being pushed against the valve box covering side 12 or the annular outer wall 22 by the strong force, watertightness (tychopotamic) can be raised substantially.

[0019] Since internal pressure can be certainly forced on the valve box covering side

12 and the annular outer wall 22 by using the part which attends Clearance S as the circular face 35 which curved to the periphery side as especially shown in this example of a gestalt, a seal ring 30 The valve box covering side 12, a base 31, and the annular outer wall 22 and the cone-like peripheral face 33 can be stuck, respectively, and it can make tychopotamic [between the valve box covering side 12 and the head of the annular outer wall 22] into a more positive thing.

[0020]

[Effect of the Invention] As explained above, while according to the seal structure of the valve box of this invention being able to perform anchoring of a seal ring and assembly of a valve box easily and being able to improve substantially the workability not only at the time of manufacture but the time of inspection, it can raise tychopotamic [of a valve box].

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sectional view of an important section in which showing the example of 1 gestalt of the seal structure of the valve box of this invention, and showing the condition before assembly.

[Drawing 2] It is the sectional view of an important section showing the condition after assembly similarly.

[Drawing 3] an example of the sluice valve of the inner screw type which applied the seal structure of this invention is shown -- it is a cross-section front view a part.

[Drawing 4] It is the sectional view of the important section in the condition before the assembly which shows an example of the conventional seal structure.

[Drawing 5] It is the sectional view of an important section showing the condition after assembly similarly.

[Description of Notations]

10 [-- An annular wall, 20 / -- An operculum, 21 / -- A flange, 22 / -- An annular outer wall, 23 / -- The body covering side of a valve box, 30 / -- A seal ring, 31 / -- A base, 32 / -- Vertical-like inner skin, 33 / -- A cone-like peripheral face, 34 / -- A top panel, 35 / -- Circular face] -- The body of a valve box, 11 -- A flange, 12 -- An operculum covering side, 13

[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号
特開2000-205412
(P2000-205412A)

(43) 公開日 平成12年7月25日 (2000.7.25)

(51) Int.Cl.⁷

識別記号

F I

テマコード* (参考)

F 1 6 J 15/10

F 1 6 J 15/10

C 3 H 0 5 1

F 1 6 K 27/00

F 1 6 K 27/00

Z 3 J 0 4 0

審査請求 未請求 請求項の数 1 O L (全 4 頁)

(21) 出願番号

特願平11-5411

(22) 出願日

平成11年1月12日 (1999.1.12)

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Fターム(参考) 3H051 AA03 BB02 BB03 BB10 CC06
CC16 EE01 FF02

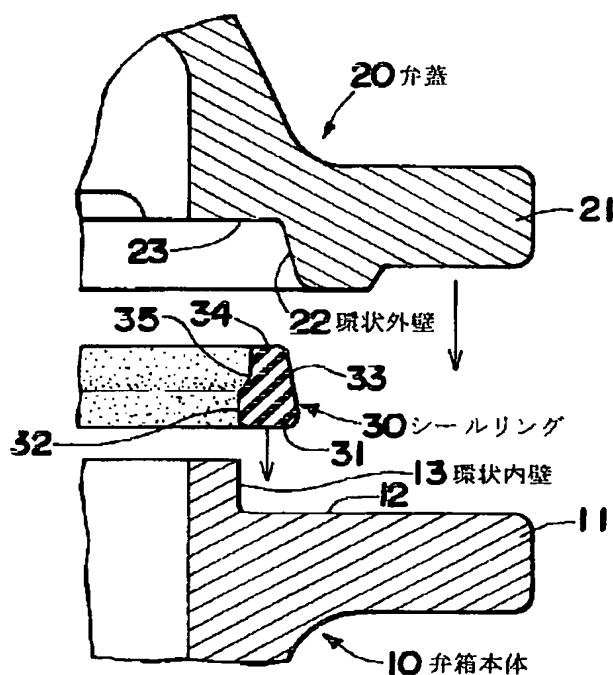
3J040 AA18 BA05 EA15 HA03 HA30

(54) 【発明の名称】 弁箱のシール構造

(57) 【要約】

【課題】 シールリングの装着を容易に行うことができ、弁箱本体と弁蓋との組付け作業の軽減を図れるとともに、水密性の向上も図れる弁箱のシール構造を提供する。

【解決手段】 弁箱本体10に環状内壁13を形成するとともに弁蓋20に環状外壁22を形成し、両壁13、22間にシールリング30を挟み込むようにする。シールリング30は、弁箱本体10に当接する底面31と、環状内壁13に当接する垂直状内周面32と、環状外壁22に当接する円錐状外周面33と、弁蓋20に当接する天面34とを有する断面形状に形成されている。



【特許請求の範囲】

【請求項1】 弁箱本体と、該弁箱本体に被着される弁蓋との間のシール構造であって、弁箱本体の弁箱被着面に、外周面が軸線と平行な円筒面からなる環状内壁を形成し、弁蓋の弁箱本体被着面に、前記環状内壁より大径でかつ軸線方向の寸法が大きく、内周面が弁箱本体方向に拡張した円錐面からなる環状外壁を形成するとともに、前記環状内壁と環状外壁との間に配置されるシールリングを、弁箱本体の弁箱被着面に当接する平面状の底面と、該底面の内周側から垂直に立上って前記環状内壁の外周面に当接する垂直状内周面と、底面の外周側から前記環状外壁の円錐面に対応して弁蓋側が縮径する方向に立ち上がった円錐状外周面と、該円錐状外周面の上端から前記弁蓋の弁箱本体被着面に当接するように内周方向に屈曲した平面状の天面とを有する断面形状に形成したことを特徴とする弁箱のシール構造。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、弁箱のシール構造に関し、詳しくは、ソフトシール仕切弁等の弁箱における弁箱本体と弁蓋との間の水密性を確保するためのシール構造に関する。

【0002】

【従来の技術】ソフトシール仕切弁等の弁箱は、弁座等を有する弁箱本体と弁棒等を保持する弁蓋との間に、ゴム等の弾性体からなるシールリング（プロフィールリング）を挟んでフランジ結合することにより、水密性を確保した状態で形成される。

【0003】図4及び図5は、従来の弁箱本体と弁蓋との間のシール構造の一例を示すものであって、図4は組付け前の状態を示す要部の断面図、図5は組付け後の状態を示す要部の断面図である。

【0004】この従来のシール構造は、弁箱本体1のフランジ2の内周にシールリング当接面となる段部3を設けるとともに、弁蓋4のフランジ5の内周にシールリング6を嵌込むための環状溝7を設けたものであって、弁箱本体1と弁蓋4との組付けは、シールリング6を弁蓋4の環状溝7内に嵌込んだ後、両フランジ2、5を突合わせてボルト・ナットで締付けることにより行われる。

【0005】

【発明が解決しようとする課題】したがって、両者を組付ける際に弁蓋4の下面側となる環状溝7内にシールリング6を嵌込む作業が必要であり、特に、組付け時にシールリング6が落下しないように両者の寸法関係が設定されているため、嵌込み作業に要する力も大きく、確実かつ強固にシールリングを嵌込まなければならなかった。さらに、シールリング6自体の形状も、内圧を受けて図5に示すような形状に変形し、その外周面がフランジ2、5間の隙間に圧着したときに所定の水密性能を発揮するような形状に形成されていた。

【0006】このため、シールリング6の嵌込みや弁蓋4の組付けにおける作業性に難点があり、また、水密性の向上にも限界があった。

【0007】そこで本発明は、シールリングの装着を容易に行うことができ、弁箱本体と弁蓋との組付け作業の軽減を図れるとともに、水密性の向上も図れる弁箱のシール構造を提供することを目的としている。

【0008】

【課題を解決するための手段】上記目的を達成するため、本発明の弁箱のシール構造は、弁箱本体と、該弁箱本体に被着される弁蓋との間のシール構造であって、弁箱本体の弁箱被着面に、外周面が軸線と平行な円筒面からなる環状内壁を形成し、弁蓋の弁箱本体被着面に、前記環状内壁より大径でかつ軸線方向の寸法が大きく、内周面が弁箱本体方向に拡張した円錐面からなる環状外壁を形成するとともに、前記環状内壁と環状外壁との間に配置されるシールリングを、弁箱本体の弁箱被着面に当接する平面状の底面と、該底面の内周側から垂直に立上って前記環状内壁の外周面に当接する垂直状内周面と、底面の外周側から前記環状外壁の円錐面に対応して弁蓋側が縮径する方向に立ち上がった円錐状外周面と、該円錐状外周面の上端から前記弁蓋の弁箱本体被着面に当接するように内周方向に屈曲した平面状の天面とを有する断面形状に形成したことを特徴としている。

【0009】

【発明の実施の形態】図1乃至図3は本発明の弁箱のシール構造の一形態例を示すものであって、図1は組付け前の状態を示す要部の断面図、図2は組付け後の状態を示す要部の断面図、図3は本発明のシール構造を適用した内ネジ式の仕切弁の一例を示す一部断面正面図である。

【0010】まず、仕切弁は、弁座や配管接続用のフランジ等を有する弁箱本体10と、弁棒等を有する弁蓋20とを、ゴム等の弾性体で形成されたシールリング30を介してフランジ結合したものであって、弁蓋20は、弁蓋20を貫通する弁棒に弁体を装着した状態で弁箱本体10に組付けられる。

【0011】弁箱本体10の上部の弁蓋被着側には、その外周にフランジ11が設けられており、フランジ上面部分に弁蓋被着面12が形成されている。この弁蓋被着面12の内周部分には、外周面が軸線と平行な円筒面からなる環状内壁13が弁蓋20側に突出した状態で設けられている。

【0012】また、弁蓋20の下部には、前記フランジ11に対向するようにしてフランジ21が設けられており、このフランジ21の内周部分に、前記環状内壁13に対応する環状外壁22と、前記弁蓋被着面12に対応する弁箱本体被着面23とが設けられている。

【0013】環状外壁22は、その内径が環状内壁13の外径よりも大径に形成されており、弁箱本体10と弁

蓋20とを組付けた際に、環状内壁13と環状外壁22との間にシールリング30を挟み込むスペースが形成できるようにしている。また、環状外壁22の軸線方向の寸法(高さ)は、環状内壁13の寸法(高さ)よりも大きく設定されており、環状外壁22の先端(下端)が弁箱被着面12に当接したときに、環状内壁13の先端(上端)と弁箱本体被着面23との間に適度な間隔S(図2参照)が形成されるようになっている。さらに、環状外壁22の内周面は、下方側の弁箱本体10側が拡張した円錐面に形成されている。

【0014】上述のように形成された環状内壁13と環状外壁22との間に装着されるシールリング30は、弁箱本体10の弁箱被着面12に当接する平面状の底面31と、該底面31の内周側から垂直に立上って前記環状内壁13の外周面に当接する垂直状内周面32と、底面31の外周側から前記環状外壁22の円錐面に対応して弁蓋20側が縮径する方向に立ち上がった円錐状外周面33と、該円錐状外周面33の上端から前記弁蓋20の弁箱本体被着面23に当接するように内周方向に屈曲した平面状の天面34とを有し、さらに、天面34の内周端と前記垂直状内周面32の上端との間に、外周側に湾曲した円弧面35を設けた断面形状で形成されている。

【0015】また、シールリング30の内径は、環状内壁13の外径と同一乃至僅かに小径に形成されており、環状内壁13部分にシールリング30を確実に取付けられるようにしている。さらに、シールリング30の高さ(底面31と天面34との距離)は、弁箱本体10と弁蓋20とを組付けた際における弁箱被着面12と弁箱本体被着面23との間隔よりも大きく設定されている。したがって、シールリング30は、弁箱被着面12と弁箱本体被着面23との間に圧縮された状態で装着されることになる。

【0016】このように形成することにより、弁箱本体10と弁蓋20とを組付ける際のシールリング30の取付けは、弁箱被着面12を上方に向けて置かれている弁箱本体10の環状内壁13の外周にシールリング30を乗せるようにするだけでよく、さらに、従来のように落下するおそれが全くないので、環状内壁13とシールリング30とを強固に嵌合させる必要がなく、従来のように環状溝内に強固に嵌込むものに比べて軽い力で容易に行うことができる。

【0017】しかも、弁箱本体10に取付けられたシー

ルリング30の円錐状外周面33に対して弁蓋20の環状外壁22が傾斜面で当接するので、シールリング30の位置ズレを生じにくく、所定の位置にシールリング30を挟み込むことができる。

【0018】また、両フランジ11, 21をボルト・ナットで締付けた時点で、シールリング30は、弁箱被着面12、環状内壁13、弁箱本体被着面23及び環状外壁22との間に圧縮された状態で取付けられることになり、使用時には、前記間隔Sから内圧がシールリング30に作用して更に圧縮され、強い力で弁箱被着面12や環状外壁22に押付けられる状態となるため、水密性(止水性)を大幅に向上させることができる。

【0019】特に、本形態例に示すように、隙間Sに臨む部分を外周側に湾曲した円弧面35とすることにより、内圧をシールリング30を弁箱被着面12及び環状外壁22に確実に押付けることができるので、弁箱被着面12と底面31、環状外壁22と円錐状外周面33をそれぞれ密着させることができ、弁箱被着面12と環状外壁22の先端との間の止水性をより確実なものにすることができる。

【0020】

【発明の効果】以上説明したように、本発明の弁箱のシール構造によれば、シールリングの取付けや弁箱の組付けを容易に行うことができ、製造時だけでなく点検時の作業性を大幅に改善することができるとともに、弁箱の止水性も向上させることができる。

【図面の簡単な説明】

【図1】 本発明の弁箱のシール構造の一形態例を示すもので、組付け前の状態を示す要部の断面図である。

【図2】 同じく組付け後の状態を示す要部の断面図である。

【図3】 本発明のシール構造を適用した内ネジ式の仕切弁の一例を示す一部断面正面図である。

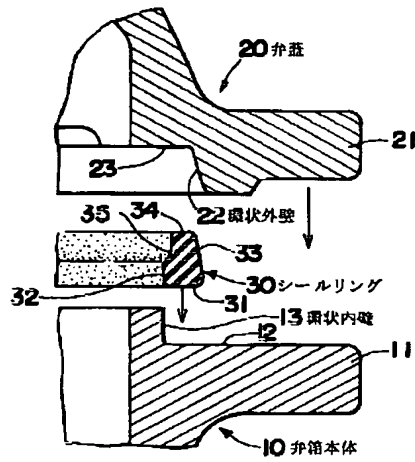
【図4】 従来のシール構造の一例を示す組付け前の状態における要部の断面図である。

【図5】 同じく組付け後の状態を示す要部の断面図である。

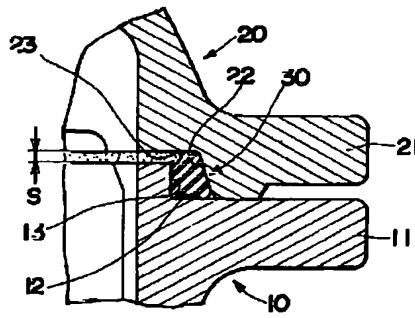
【符号の説明】

10…弁箱本体、11…フランジ、12…弁蓋被着面、13…環状内壁、20…弁蓋、21…フランジ、22…環状外壁、23…弁箱本体被着面、30…シールリング、31…底面、32…垂直状内周面、33…円錐状外周面、34…天面、35…円弧面

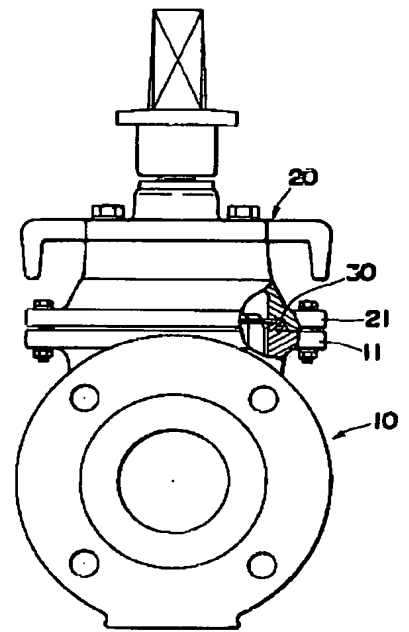
【図1】



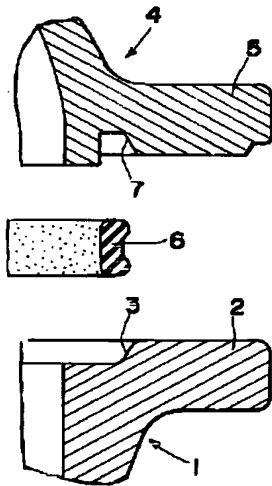
【図2】



【図3】



【図4】



【図5】

